

## HEALPix 2.00 benchmark

<http://healpix.jpl.nasa.gov>

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| $\ell_{\max}=1024, N_{\text{side}}=512$             | HEALPix Codes (2.4GHz AMD Opteron) |                       |                       |
|---|------------------------------------|-----------------------|-----------------------|
| <b>clock time [s]</b> &<br><i>memory usage [MB]</i> | F90 v1.22<br>Ifc 9.0               | F90 v2.0<br>Ifc 9.0   | C++ v2.0<br>gcc 3.2.3 |
| map synthesis T                                     | <b>17.4 s</b> <i>29 MB</i>         | <b>6.6</b> <i>23</i>  | <b>5.3</b> <i>14</i>  |
| map analysis T                                      | <b>18.8</b> <i>29</i>              | <b>6.1</b> <i>23</i>  | <b>6.5</b> <i>20</i>  |
| map synthesis TQU                                   | <b>43.0</b> <i>78</i>              | <b>16.6</b> <i>67</i> | <b>15.5</b> <i>50</i> |
| map analysis TQU                                    | <b>47.8</b> <i>78</i>              | <b>16.0</b> <i>67</i> | <b>15.5</b> <i>58</i> |

Table 1: serial application. Clock time (in sec.) and memory usage (in MB) to synthesize and analyse Temperature only and Polarisation+Temperature maps for  $\ell_{\max}=1024, N_{\text{pix}}=3 \times 10^6, \theta_{\text{pix}}=6.9\text{arcmin}$  ( $N_{\text{side}}=512$ ). Those performances were measured on a single 2.4GHz AMD Opteron CPU. In the case of HEALPix 2.0, memory usage are indicated for single precision facilities. Using double precision option would double the memory usage while leaving the execution time unchanged *Ifc*: Intel Fortran compiler, *Icc*: Intel C/C++ compiler, *gcc*: GNU C/C++ compiler.

| $\ell_{\max}=3000, N_{\text{side}}=2048$            | HEALPix Codes ( $4 \times 2.4\text{GHz}$ AMD Opteron) |                       |                       |
|---|---|-----------------------|-----------------------|
| <b>clock time [s]</b> &<br><i>memory usage [MB]</i> | F90 v1.22<br>Ifc 9.0                                  | F90 v2.0<br>Ifc 9.0   | C++ v2.0<br>Icc 9.0   |
| map synthesis T                                     | <b>144 s</b> <i>437 MB</i>                            | <b>55</b> <i>270</i>  | <b>46</b> <i>240</i>  |
| map analysis T                                      | <b>148</b> <i>437</i>                                 | <b>60</b> <i>270</i>  | <b>56</b> <i>263</i>  |
| map synthesis TQU                                   | <b>394</b> <i>1,000</i>                               | <b>151</b> <i>800</i> | <b>170</b> <i>716</i> |
| map analysis TQU                                    | <b>391</b> <i>1,000</i>                               | <b>146</b> <i>800</i> | <b>151</b> <i>785</i> |

Table 2: parallel application. Same as Table ??, on four 2.4GHz AMD Opteron CPUs, for  $\ell_{\max}=3000, N_{\text{pix}}=50 \times 10^6, \theta_{\text{pix}}=1.7\text{arcmin}$  ( $N_{\text{side}}=2048$ ). All HEALPix codes compiled with OpenMP to allow shared memory parallelisation